**Chapter 1- Observing Cells**

**Microscopes and Cells**

**Early Microscopes:**

Interest in microscopes began as early as the **seventeenth** century.

- During this period, Anton van **Leeuwenhoek** built **250** microscopes.

- In 1660, the English scientist **Robert Hooke** used the term "cells" to describe the honey-comb like structure of the cork sample that he was observing with a microscope.

- In **1824**, the French scientist Henri **Dutrochet** observed and described that plants grew by increasing the number of **cells**. He was the first to recognize that cells are a fundamental part of living organisms.

- In 1831, the Scottish scientist **Robert Brown** observed and described a centrally located body in the cell. He called it the **nucleus**.

- In **1839**  the German physiologist Theodore Schwann discovered that all living things are composed of cells.

- In 1858, the German physician **Theodore Schwann** suggested that all cells come from pre-existing cells.

- Lenses of early microscope were not very good and produced only fuzzy images.

**Microscopes Today: Name the two main types of electron microscopes and describe how each one works(pg9)**

**Why study microscopes:**

All living things are made up of **cells**. Thus, scientists must study living things at the **cellular** level to understand them. Some organisms such as **bacteria** are made of single cells and are too small to be seen by the naked eye alone. To help our efforts in fighting disease, we use microscopes to study these tiny organisms in detail.

**How does a microscope magnify?**

A microscope makes things appear larger by passing light coming from the object through lenses. A **lens** is a piece of glass that has been specially crafted to bend light. The light rays coming from the object appear larger. Different lenses have different characteristics, such as thickness, so they can **magnify** to different powers. The power the magnification is engraved on the side of a lens and is indicated by a number followed by an **X**. Thus, if a lens magnifies an object 40 times, it is marked 40**x**.

**Road to Discovery:**

**Zacharias Jansen** of Holland is recognized by most historians as the inventor of the microscope in about **1595**. **Jansen’s** microscope was a compound instrument that contained two lenses. The first major improvement in microscopes, the introduction of a three-way lens system, occurred early in the seventeenth century.

For many years after its invention, the microscope was used mainly as a curiosity, and its utility as a scientific instrument was established nearly 100 years after its invention. One of the greatest microscopists was **Marcello Malpighi**. He used the microscope to discover capillaries, the smallest vessels that link arteries to veins.

Most lenses were rather crude and produced blurry images with colourful halos around them. The use of multiple lenses compounded the problem. Anton van Leeuwenhoek found he could get much clearer images by using a single, high-power, quality lens. His method of crafting high-quality lenses was kept secret.